

The Role of DOE's Office of Energy Dominance Financing in U.S. Nuclear Energy Leadership



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Summary

Nuclear energy is an important technology for U.S. energy security and competitiveness, and the U.S. Department of Energy (DOE) Office of Energy Dominance Financing (EDF) is essential to nuclear energy's success. By investing in early-stage projects, the EDF accelerates technological advancement, attracts private capital, and ensures U.S. leadership in meeting rapidly growing global energy demand, enhancing our economic competitiveness, geopolitical influence and national security.

While the nuclear industry is seeing major investments, financing early mover projects remains difficult. Private-sector lenders view early-stage commercial technologies as high risk, and private investors focus on financial return and risk rather than policy imperatives such as energy security. Thus, it can be challenging to raise adequate capital for early mover nuclear energy projects. To realize nuclear energy deployment potential in the 2030s and beyond, it is imperative to finance these projects now. The EDF plays the crucial role of financing early mover projects to help bridge the gap between demonstrations and projects financeable with private capital.

A robust nuclear industry remains crucial for national and energy security interests. China is aggressively investing in nuclear energy and exporting their technology to countries that are new to nuclear energy as a means of deepening their reliance on China. If the United States is to compete on a global stage, there needs to be a strong domestic nuclear industry. However, private investors are not incentivized to take these interests into account. Through loans finalized by the Trump Administration in 2019, EDF was vital to the first deployment of a new, U.S.-developed reactor type at the Vogtle plant in Georgia. These strategic early EDF loans are helping the U.S. to compete with foreign state-backed nuclear companies by unlocking private capital.

EDF is now facilitating the restart of a retired reactor in Michigan, the first such project in the country, as well as the restart of Three Mile Island Unit 1 at the Crane Clean Energy Center by Constellation Energy Corporation. EDF also recently awarded Southern Company a new \$26.5b loan to uprate nuclear facilities and other electricity system upgrades. Current EDF loan applications cover a broad range of nuclear energy innovations, including component manufacturing, small modular and microreactor deployment, and fuel cycle improvements. Funding a fraction of these projects could move whole subsets of the industry to maturity, allowing the industry to access the private development capital it needs to be successful.

EDF's extensive technological due diligence is more rigorous than what private lending institutions, equity firms, and infrastructure funds typically commit, due to both technical expertise and the resource commitment EDF can make to new technologies. Loan commitments from EDF are viewed positively by many in the financial community because the due diligence is completed by technical experts at the DOE. Thus, EDF has helped reduce technological risk in funding projects.

While EDF's impact on the nuclear industry has been large, it is important to note that this is achieved with a relatively small amount of federal appropriations. The credit subsidy and administrative expenses are the only aspect of an EDF loan that is paid through

appropriations. For example, \$5 billion was appropriated in 2022 for credit subsidies under the DOE loan office's Energy Infrastructure Reinvestment program to enable lending authority of \$250 billion. The One Big Beautiful Bill Act reduced appropriations to \$1 billion while maintaining around \$250 billion in lending authority. Even if this appropriated amount were tripled, the appropriated amount would remain less than 1% of the total lending amount.

Introduction

Nuclear energy is an essential technology for meeting U.S. competitiveness, energy security and climate goals. The nuclear industry is at a critical juncture as it moves from research and development to demonstration projects and new reactor commercialization. During the early part of this century, U.S. nuclear power largely maintained its status quo, with retirements of some plants and uprates of others to increase their capacity. A new wave of players and novel nuclear technologies emerged in the late 2000s and 2010s. The first advanced light water reactors in the U.S. have been put into service, conditions have become favorable for uprating existing reactors and refurbishing and restarting retired reactors, and construction activities are beginning for advanced non-light water reactor projects. The nuclear energy industry is emerging from a period of stasis but still requires government action to leverage private investment and encourage early movers in the private sector.

Burgeoning energy technology industries, workers, the financial community, and local communities have benefited greatly from Office of Energy Dominance Financing (EDF) loans. Nuclear energy projects have received loans under multiple presidential administrations that have greatly improved U.S. energy and technology capabilities.

History of Office of Energy Dominance Financing

EDF was established in 2005 as the Loan Program Office to accelerate the development and deployment of novel energy technologies through financial support for large-scale infrastructure projects. EDF focuses on technologies that are on the cusp of commercialization, providing them with access to capital that is not reasonably available in private markets.

Since its inception, EDF has provided substantial financial support that has driven significant technological advancement in the energy sector. EDF has provided over \$30 billion in loans, with a lower loss ratio than comparable private sector loans.

This debt financing has been instrumental in commercializing technologies such as advanced geothermal energy across the western United States. A \$98.5 million loan was awarded to Blue Mountain Energy for their Humboldt County, NV site in 2010.¹ This loan, which was paid back in March 2022, was key to building an advanced geothermal plant and workforce to operate it. In 2023, Fervo Energy demonstrated their horizontal advanced geothermal technology at the Blue Mountain site, benefiting from the previous technology and workforce development financed by EDF. Fervo has gone on to attract major commitments from

¹ [Blue Mountain EDF Page](#)

Google, Southern California utilities, and others for their new large-scale facility. In 2025, Fervo announced that they are funding their next facility entirely with private funds under a traditional non-recourse project financing structure. This is a major success for a technology that was initially enabled by EDF.

The potential effectiveness and value of EDF financing can be illustrated by the history of how EDF helped move solar and wind energy from financially risky investments to repeatable projects funded almost entirely by private capital. In the early 2000s, there were very few utility-scale solar projects and debt financing was difficult. Solar deployment at utility scale requires a large amount of project capital. EDF gave several loans to wind and solar energy projects when attracting private capital was difficult. Utility solar projects now have 20 times more private capital investment than they did prior to the first EDF loan. Similarly, private capital in utility-scale wind projects has more than doubled.

The Private Capital Multiplier

Additional private capital follows EDF investment, validating EDF's rigorous diligence

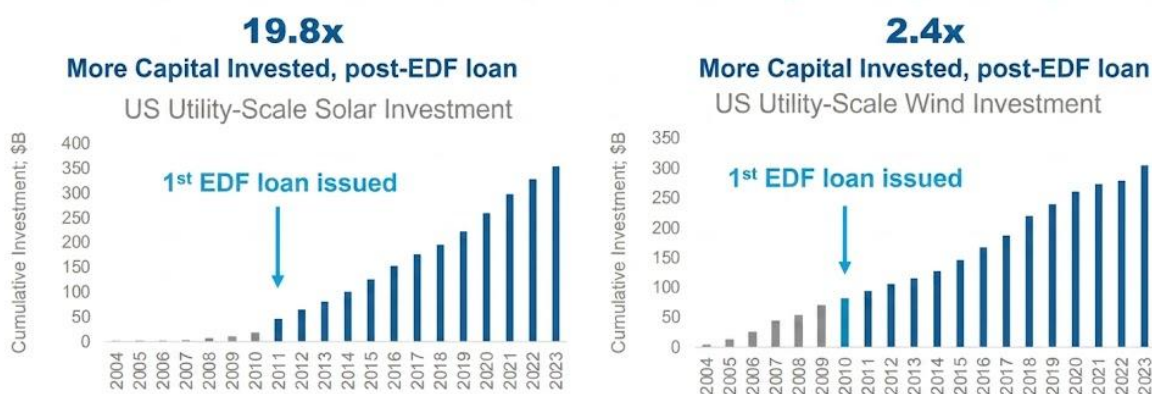


Figure 1: Follow-on private capital after EDF investment after the first EDF loans in wind and solar²

Nuclear power today is much like those earlier technologies: private project debt financing would be challenging because of the perceived technical risk associated with first-of-a-kind projects. Funding key projects and supply chain developments would have a profound impact on nuclear energy deployments, much like it did for wind and solar energy.

EDF plays a catalytic role in the development of emerging technologies and creation of thousands of jobs. EDF-funded projects have created 47,300 permanent jobs from 2010 to 2024³ and kept critical manufacturing, construction, and heavy industry jobs in the United States. These are direct jobs and do not account for the large follow-on effects in each company and industry as technologies are commercialized.

² Reproduced with info from slide 30 of [Investing With EDF](#)

³ See [IMPLEMENTING PRESIDENT TRUMP'S ENERGY DOMINANCE AGENDA: Past and Future Role of the Loan Programs Office](#) for more info.

How EDF Works

EDF's nuclear energy projects are generally funded out of the Title 17 Clean Energy Financing program under one of its two categories: Title 1703 Innovative Energy or Title 1706 Energy Dominance Fund. Each loan application moves through the process outlined in Figure 2.



Figure 2: EDF application and award process⁴

Pre-application and Application & Review Part 1 focus on the eligibility and readiness of the project. Innovative energy and innovative supply chain categories require the project to be ready to be commercialized and have high potential for catalytic effect on the market. EDF funding is specific to projects that are early in the commercialization phase, i.e., that are ready for commercial deployment but because they have not yet been deployed, or deployments have been very limited, are difficult to finance in private markets. EDF is able to do more in-depth technological due diligence (described further below) than is feasible for private lenders, leveraging its unique access to DOE technical expertise. Utilizing this expertise to assess the risk of these early-stage projects reduces economic uncertainty and paves the way for private-sector financing of future projects.

Application & Review Part 2 is a rigorous technical and financial evaluation. EDF assesses viability based on:

- “The strength of the contractual terms of the eligible project (if commercially reasonably available);
- The forecast of noncontractual cash flows;
- Cash sweeps or early payments and other structural enhancements;

⁴ Diagram reproduced from [Getting to know LPO \(EDF\)](#) document.

- The projected financial strength of the borrower at the time of [financial] close and throughout the loan term;
- The financial strength of the investors and strategic partners of the borrower, if applicable;
- Appropriate attention to management of project risk, including through the Community Benefits Plan; and
- Other financial metrics and analyses that are relied on by the private lending community and rating agencies⁵

Applicants must prove to EDF that the project has financial backing, off-take, and capabilities needed to repay the loan. This can be achieved through contractual off-take agreements such as firm power purchase agreements (PPAs), credit ratings from financial institutions, and contractual partnerships with entities for critical components and services.

In addition, applicants must go through a rigorous technical due diligence process. EDF works with the applicant, ensuring that the project is at a sufficient technology readiness level, the team has the technical capability to deliver, and the technical project assumptions are sound. This technological due diligence is more rigorous than what lending institutions, private equity, and infrastructure funds can accomplish. Approvals from EDF are viewed positively by many in the financial community because the due diligence is completed by technical experts at the DOE. A conditional commitment is only extended if the due diligence process finds that the technical and financial risk is appropriate for the EDF program.

After a conditional commitment is awarded, financial terms are negotiated and set. The loans awarded under EDF have an interest rate of the U.S. Treasury rate set at the time each loan tranche is drawn, plus 0.375%, plus a risk-based adjustment informed by the credit rating of the project⁶. The maximum loan term is 30 years, with most loans of shorter duration. These loans are secured, meaning that the DOE has a claim on assets in the event of loan defaults.

In addition, to offset the risk of these loans, EDF assesses a “credit subsidy cost,” which depends on the due diligence process and is assessed individually for each loan.⁷ Historically, the credit subsidy costs, and other fees collected by EDF, have more than offset any losses that EDF has incurred. For example, by the end of FY23, EDF had \$4.3 billion credit subsidy in reserve, substantially higher than the realized losses of \$1 billion. The credit subsidy has been covered at least partially by appropriated funds since 2009.

The low appropriation amount when compared to loan authority also extends to more recently appropriated funds. Congress appropriated \$1 billion for credit subsidies within EDF Title 1706 program to enable lending authority of \$250 billion. Even if the appropriated amount were tripled, it would remain less than 1% of the total lending amount.

The management of risk through the due diligence process and credit subsidy assessment, combined with the appropriation of funds to pay for credit subsidy costs, enables the government to leverage a small amount of appropriations to support a much larger amount

⁵ Criteria from [42 U.S. Code § 16512\(d\)\(1\)\(B\)](#)

⁶ [Pricing for LPO \(EDF\) Financing by Program](#)

⁷ [Understanding Credit Subsidy](#), Office of Energy Dominance Financing

of lending, greatly magnifying the impact of this public funding on the deployment of new, innovative energy technologies.

Nuclear-Specific EDF Awards and Their Effects

This section will focus on two EDF loans within the nuclear industry; Vogtle units 3 and 4 construction and the Holtec Palisades restart. As of April 2026, other EDF nuclear loans include the Crane Clean Energy Center restart and a financing package that includes updates to nuclear facilities in Alabama and Tennessee.

Vogtle Units 3 and 4: Reducing Cost, Enhancing Competitiveness

EDF provided loans totaling \$12 billion to build Vogtle units 3 and 4 in Georgia, including \$3.7 billion awarded under the Trump Administration⁸. The loans served as an important financing mechanism for getting the first Westinghouse AP1000 advanced light water reactors built in the United States.

Vogtle 3 and 4 were the first two reactors of this type in the U.S. that, despite construction cost overruns, have created tremendous opportunity within the local and regional economy. The Vogtle project created 900 permanent jobs, as well as 9,000 onsite jobs during construction, essentially creating an experienced local and regional nuclear workforce.⁹ Georgia now has two new large carbon-free electricity generators that can run reliably for 80+ years, stimulating economic development.¹⁰ Based on the experience at Vogtle and other analysis, a hypothetical two-unit AP-1000 would be expected to increase GDP by over \$10b.¹¹

In addition to its local and regional benefits, the financing to complete Vogtle had global implications. China had already completed four AP1000 reactors by 2018 and started to build their own modified design. The Vogtle project's completion was crucial in moving the United States toward competing with the China National Nuclear Corporation on a global stage. Exports of nuclear energy technologies, which establish 100-year relationships, support not only U.S. competitiveness but also long-term geopolitical relationships critical to U.S. foreign policy objectives as well as leadership in nuclear non-proliferation and safety. Thus, the EDF funds that enabled the completion of Vogtle also critically supported the U.S. capability for nuclear energy export and long-term foreign policy objectives.

Cost reduction between Vogtle 3 and 4 also offers compelling evidence that EDF loans are working as intended and derisking the technology for future investments. The reduction in the time it took to achieve several key construction milestones from Vogtle Unit 3 to 4 is shown in Figure 3. These duration reductions led to substantial savings on labor cost when comparing the two units.

⁸ [VOGTLE | Department of Energy](#)

⁹ [Vogtle Unit 4 Enters Commercial Service](#)

¹⁰ [Advanced Nuclear - Pathways to Commercial Liftoff](#)

¹¹ [The Economic Impact of a Two-Unit Ap1000 Project in the United States](#)

Days between major milestones for Vogtle Units 3 and 4, days

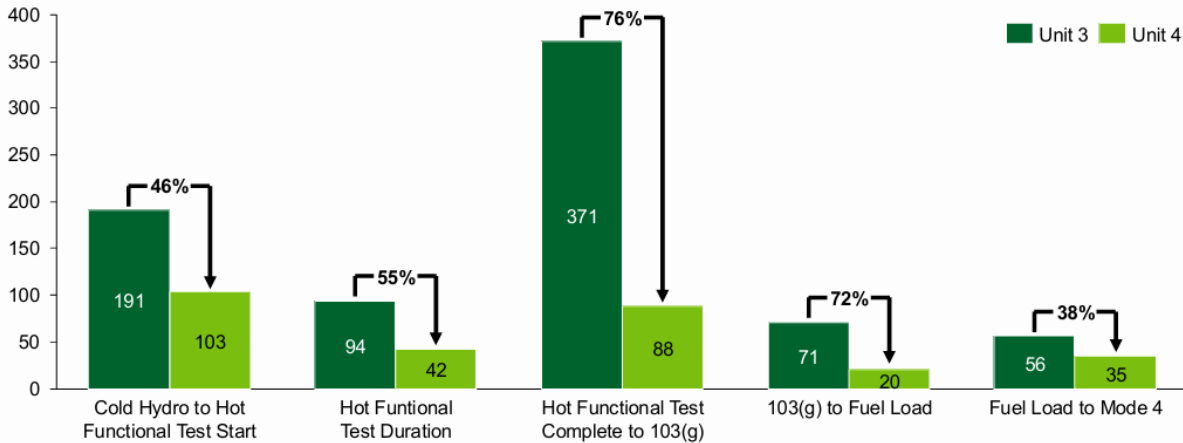


Figure 3: Reduction in time of key activities from Vogtle unit 3 to 4¹²

The reductions in construction time and cost seen from Vogtle unit 3 to 4 were just the beginning. The intent of an EDF loan is to help a technology achieve commercial success in the future. The Vogtle project was able to identify key roadblocks and challenges in first-of-a-kind deployment. The demonstrated reduction in capital costs, combined with the institutional knowledge of what it takes to complete a reactor, reduce the risk profile of subsequent projects. Because of the “learning by doing” enabled by EDF, the risk profile of new AP1000s will be much closer to what private financiers are comfortable with.

Vogtle Units 3 and 4 overnight capital cost categories, 2024 \$/kW

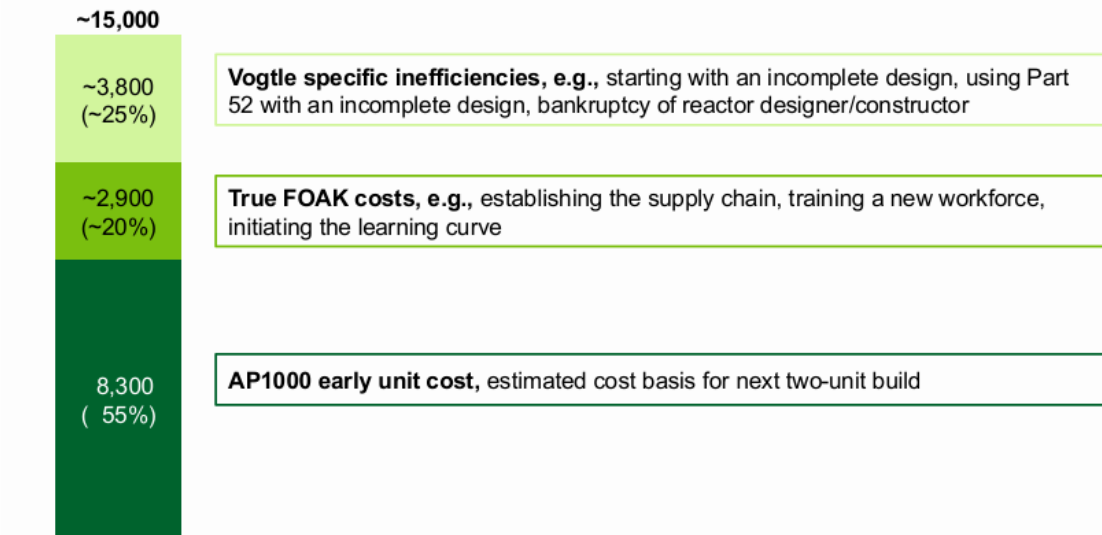


Figure 4: Vogtle cost versus early unit AP1000¹³

¹² Plot from [Advanced Nuclear - Pathways to Commercial Liftoff](#)

¹³ Plot from [Advanced Nuclear - Pathways to Commercial Liftoff](#)

Private capital markets do not incorporate the policy drivers of national energy security and competitiveness, which made the Vogtle EDF loan an important tool for supporting U.S. interests. Subsequent AP1000 projects will be less expensive and less risky, and thus more financeable via private capital.

Holtec Palisades: First of a Kind Initiative That Can Be Replicated

While the Vogtle project has shown that EDF enabled cost reduction from one reactor build to the next, the Holtec Palisades project has already shown the effects of EDF on follow-on investment. Prior to Holtec Palisades, there were no announced projects to restart retired nuclear reactors. Holtec applied for debt financing for their effort to restart the 800 MW Palisades nuclear plant in Michigan. In September 2024, EDF awarded a \$1.52 billion loan for the project, which is expected to support or retain 600 jobs.¹⁴ Holtec is on track to bring the facility online in 2026, just two years after the EDF loan's close.

With electric load growing across the United States from AI data centers and onshoring of manufacturing, Holtec Palisades is a timely project. This load growth could strain the country's current electricity capacity, which would dampen U.S. technology and manufacturing competitiveness. Strategically funding a nuclear reactor restart is an example of using EDF to bolster critical infrastructure required to drive the U.S. economy.

After Holtec Palisades was announced, Microsoft and Constellation announced plans to restart Three Mile Island (TMI) Unit 1 and set up the Crane Clean Energy Center. Constellation was later awarded an EDF loan to restart TMI unit 1. In addition, the CEO of NextEra Energy stated that the company will be restarting the Duane Arnold Nuclear Plant in Iowa by 2029.¹⁵ These projects are examples of follow-on investment of the type that was derisked by the EDF loan to Holtec. Other benefits of learning by doing, such as built-out supply chains or a more experienced workforce, will also assist follow-on projects.

The investment by EDF has shown private investors that nuclear reactor restarts are a viable pathway to quickly adding clean firm capacity. The Holtec Palisades financing provides an example of how EDF financing can lead the way for further private-sector investment in innovative energy solutions.

Recommendations

To enable nuclear energy project success, EDF requires three things:

- Adequate funding (appropriations for both credit subsidies and administrative expenses, as well as lending authorization);
- Sufficient time (authorization and funding that is in place long enough to allow multiple nuclear energy projects to proceed in series); and
- Adequate staffing levels (to perform due diligence, establish appropriate loan terms, monitor project progress, and administer loans).

¹⁴ [HOLTEC PALISADES | Department of Energy](#)

¹⁵ [NRC shares Duane Arnold restart progress at public hearing -- ANS / Nuclear Newswire](#)

Adequately funding Title 1703 and 1706 programs ensures that both new technologies and infrastructure reinvestment projects can receive loans. Sufficient lending authority, on the order of hundreds of billions of dollars, will allow for multiple projects and multiple technologies. Since, for example, the Vogtle project loan guarantees were for \$12b, the Administration's goal to start construction on ten new light water reactors by 2030¹⁶ could require around \$100b in loan guarantees. Similarly, there must be sufficient appropriated credit subsidy for EDF to lend to projects with different business models, such as in restructured electricity markets or data center offtake agreements. A single large light water reactor project could use over \$1b in credit subsidy on its own. Thus, a set of these projects would be unable to proceed without billions of dollars in appropriated credit subsidy.

Extending the lending authority and appropriation for credit subsidy into the 2030s maximizes the effectiveness of EDF for the nuclear industry by funding both initial and follow-on projects. Funding a first-of-a-kind project will lead to greater interest but will not provide sufficient confidence in the construction process and costs among private financiers. Funding two to five projects is needed to provide commercial lenders with the confidence to support an industry, to encourage supply chain investments, and to continue to engage the workforce. This will all lead to an active industry that attracts substantial private investment. Keeping lending authority and credit subsidy available into the 2030s is crucial for successful commercialization and a robust nuclear industry.

EDF must also have adequate staffing to carry out its due diligence and loan disbursement activities. Adequate appropriations for administrative expenses are critical, as several projects will be seeking loans in the later 2020s. These appropriations help ensure that application review, due diligence, and disbursement activities move quickly.

EDF is Essential to Nuclear Success

Overall, EDF's support of early-stage projects with catalytic capital and accessible debt is crucial for the growth of the nuclear energy industry, as well as achieving national goals related to industrial competitiveness, energy security, and national security. By strategically funding early-stage projects, EDF is not only accelerating technological advancements, but also creating a pathway for follow-on investment by the private sector. EDF plays a critical role in bridging the gap between innovative projects and market viability, ensuring the United States remains at the forefront of the global energy landscape.

¹⁶ President Trump's nuclear executive orders in June 2025 set a goal to have 10 new large LWRs in construction by 2030. See here for details: <https://www.energy.gov/ne/articles/9-key-takeaways-president-trumps-executive-orders-nuclear-energy>